

## Introduction

This installation guide provides instructions for installation, startup, and adjustment. To receive a copy of the instruction manual, contact your local Sales Office or view a copy at [www.emersonprocess.com/regulators](http://www.emersonprocess.com/regulators). For further information refer to:

627 Series Instruction Manual, form 5252, D101328X012.

## P.E.D. Categories

This product may be used as a safety accessory with pressure equipment in the following Pressure Equipment Directive 97/23/EC categories. It may also be used outside of the Pressure Equipment Directive using sound engineering practice (SEP) per table below.

PRODUCT SIZE	CATEGORIES	FLUID TYPE
DN 20 to 25 (NPS 3/4 to 1)	SEP	
DN 50 (NPS 2)	I, II	1

## Specifications

### Available Constructions

**Type 627:** Direct-operated pressure reducing regulator equipped with a pitot tube for greater regulated capacities.

**Type 627R:** Type 627 with internal relief and with an open throat.

**Type 627LR:** Type 627R with light rate relief spring

**Type 627M:** Type 627 with a stem seal between the body outlet pressure and diaphragm case. Pressure is measured under the diaphragm through the 1/4 NPT downstream control line connection.

**Type 627MR:** Type 627M with internal relief.

**Type 627H:** Type 627 with a diaphragm limiter to deliver a higher outlet pressure.

**Type 627HM:** Type 627H with a stem seal between the body outlet pressure and diaphragm case.

Pressure is measured under the diaphragm through two 1/4 NPT downstream control line connections.

### Body Sizes and End Connection Styles<sup>(1)</sup>

BODY SIZES	END CONNECTION STYLES	CONSTRUCTION AVAILABLE
NPS 3/4	NPT	
NPS 1	NPT, CL150 RF, CL300 RF, CL600 RF, and Long Body	All
NPS 2	NPT, CL150 RF, CL300 RF, CL600 RF, and Long Body	

### Proof Test Pressure

All Pressure Retaining Components have been proof tested per Directive 97/23/EC - Annex 1, Section 7.4

1. The pressure/temperature limits in this Installation Guide and any applicable standard or code limitation should not be exceeded.
2. Types 627, 627H, 627R, and 627LR are limited by maximum diaphragm casing pressure.
3. Temperature may decrease these maximum pressures.

### Maximum Cold Working Pressure of Body Inlet<sup>(1)(3)</sup> (Body Rating)

**NPT Steel:** 138 bar (2000 psig)

**Flanged Steel:** 103 bar (1500 psig)

**Ductile Iron:** 69,0 bar (1000 psig)

### Maximum Valve Disk Inlet Pressure Rating<sup>(1)</sup>

**Nylon (PA) Disk:** 138 bar (2000 psig)

**Nitrile (NBR) Disk:** 69,0 bar (1000 psig)

**Fluorocarbon (FKM) Disk:** 20,7 bar (300 psig)

### Maximum Operating Inlet and Outlet Pressure Ranges<sup>(1)</sup>

See Table 1

### Maximum Spring and Diaphragm Casing Pressure<sup>(1)</sup>

See Table 2

### Maximum Body Outlet Pressure<sup>(1)(2)</sup> (Types 627M, 627MR, and 627HM Only)

**NPT Steel:** 138 bar (2000 psig)

**Flanged Steel:** 103 bar (1500 psig)

**Ductile Iron:** 69,0 bar (1000 psig)

### Temperature Capabilities

-29° to 82°C (-20° to 180°F)

## Installation

### WARNING

Only qualified personnel should install or service a regulator. Regulators should be installed, operated, and maintained in accordance with international and applicable codes and regulations, and manufacturer's instructions.

If the regulator vents fluid or a leak develops in the system, it indicates that service is required. Failure to take the regulator out of service immediately may create a hazardous condition.

Personal injury, equipment damage, or leakage due to escaping fluid or bursting of pressure-containing parts may result if this regulator is overpressured or is installed where service conditions could exceed the limits given in the Specifications section and Tables 1 and 2, or where conditions exceed any ratings of the adjacent piping or piping connections.

To avoid such injury or damage, provide pressure-relieving or pressure-limiting devices (as required by the appropriate code, regulation, or standard) to prevent service conditions from exceeding limits.

Additionally, physical damage to the regulator could result in personal injury and property damage due to escaping fluid. To avoid such injury and damage, install the regulator in a safe location.

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**Table 1. Maximum Inlet Pressures and Outlet Pressure Ranges**

TYPES	OUTLET PRESSURE RANGE, SPRING PART NUMBER, AND COLOR	ORIFICE SIZE, mm (inches)	MAXIMUM INLET PRESSURE, BAR (psig) <sup>(1)</sup>		
			Nylon (PA) Disk	Nitrile (NBR) Disk	Fluorocarbon (FKM) Disk
627 and 627M <sup>(3)</sup>	0,34 to 1,4 bar (5 <sup>(2)</sup> to 20 psig) 10B3076X012 Yellow	2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
		3,2 (1/8)	69,0 (1000)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	51,7 (750)	51,7 (750)	20,7 (300)
		6,4 (1/4)	34,5 (500)	34,5 (500)	20,7 (300)
		9,5 (3/8)	20,7 (300)	20,7 (300)	20,7 (300)
		13 (1/2)	17,2 (250)	17,2 (250)	20,7 (300)
	1,0 to 2,8 bar (15 to 40 psig) 10B3077X012 Green	2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
		3,2 (1/8)	103 (1500)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	69,0 (1000)	69,0 (1000)	20,7 (300)
		6,4 (1/4)	51,7 (750)	51,7 (750)	20,7 (300)
	2,4 to 5,5 bar (35 to 80 psig) 10B3078X012 Blue	9,5 (3/8)	34,5 (500)	34,5 (500)	20,7 (300)
		13 (1/2)	20,7 (300)	20,7 (300)	20,7 (300)
		2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
		3,2 (1/8)	138 (2000)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	121 (1750)	69,0 (1000)	20,7 (300)
627R and 627MR	10B3076X012 Yellow	6,4 (1/4)	103 (1500)	69,0 (1000)	20,7 (300)
		9,5 (3/8)	69,0 (1000)	69,0 (1000)	20,7 (300)
		13 (1/2)	51,7 (750)	51,7 (750)	20,7 (300)
		2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
		3,2 (1/8)	103 (1500)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	69,0 (1000)	69,0 (1000)	20,7 (300)
	10B3077X012 Green	6,4 (1/4)	51,7 (750)	51,7 (750)	20,7 (300)
		9,5 (3/8)	300 (20,7)	20,7 (300)	20,7 (300)
		13 (1/2)	200 (13,8)	13,8 (200)	20,7 (300)
		2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
	10B3078X012 Blue	3,2 (1/8)	121 (1750)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	69,0 (1000)	69,0 (1000)	20,7 (300)
		6,4 (1/4)	51,7 (750)	51,7 (750)	20,7 (300)
		9,5 (3/8)	20,7 (300)	20,7 (300)	20,7 (300)
		13 (1/2)	13,8 (200)	13,8 (200)	20,7 (300)
627LR	10B3079X012 Red	2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
		3,2 (1/8)	69,0 (1000)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	51,7 (750)	51,7 (750)	20,7 (300)
		6,4 (1/4)	34,5 (500)	34,5 (500)	20,7 (300)
	1,0 to 2,8 bar (15 to 40 psig)	9,5 (3/8)	20,7 (300)	20,7 (300)	20,7 (300)
627H and 627MH <sup>(3)</sup>	10B3078X012 Blue	13 (1/2)	13,8 (200)	13,8 (200)	13,8 (200)
		2,4 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)
		3,2 (1/8)	138 (2000)	69,0 (1000)	20,7 (300)
		4,8 (3/16)	121 (1750)	69,0 (1000)	20,7 (300)
		6,4 (1/4)	103 (1500)	69,0 (1000)	20,7 (300)
	10B3079X012 Red	9,5 (3/8)	69,0 (1000)	20,7 (300)	13,8 (200)
		13 (1/2)	51,7 (750)	13,8 (200)	13,8 (200)
		2,34 (3/32)	138 (2000)	69,0 (1000)	20,7 (300)

1. For inlet pressure in excess of 69,0 bar (1000 psig), refer to the maximum body and disk pressure ratings in the Specifications section.

2. For pressure settings under 0,69 bar (10 psig), inlet pressure should be limited to approximately 6,90 bar (100 psig) so the setpoint adjustment can be obtained.

3. The unbalance forces change from the wide-open monitor mode to an active regulator mode such that the Type 627M or 627MH should have a 9,5 mm (3/8-inch) or larger orifice.

■ - Shaded areas indicate that Fluorocarbon (FKM) or Nylon (PA) disk material is not available.

Clean out all pipelines before installation of the regulator and check to be sure the regulator has not been damaged or has not collected foreign material during shipping. For threaded NPT bodies, apply pipe compound to the male pipe threads.

For flanged bodies, use suitable line gaskets and approved piping and bolting practices. Install the regulator in any position desired, unless otherwise specified, but be sure flow through the body is in the direction indicated by the arrow on the body.

**Note**

**It is important that the regulator be installed so that the vent hole in the spring case is unobstructed at all times. For outdoor installations, the regulator should be located away from vehicular traffic and positioned so that water, ice, and other foreign materials cannot enter the spring case through the vent. Avoid placing the regulator beneath eaves or downspouts, and be sure it is above the probable snow level.**

**Overpressure Protection**

The recommended pressure limitations are stamped on the regulator nameplate. Some type of overpressure protection is needed if the actual inlet pressure exceeds the maximum operating outlet pressure rating. Overpressure protection should also be provided if the regulator inlet pressure is greater than the safe working pressure of the downstream equipment.

Regulator operation below the maximum pressure limitations does not preclude the possibility of damage from external sources or debris in the line. The regulator should be inspected for damage after any overpressure condition.

**Table 2. Maximum Spring and Diaphragm Casing Pressure<sup>(1)</sup>**

MAXIMUM PRESSURE DESCRIPTION	DIAPHRAGM CASING MATERIAL	TYPE 627, BAR (psig)	TYPES 627R AND 627LR, BAR (psig)	TYPE 627M, BAR (psig)	TYPE 627MR, BAR (psig)	TYPES 627H AND 627HM, BAR (psig)
Maximum pressure to spring and diaphragm casings to prevent leak to atmosphere other than relief action (internal parts damage may occur).	Die cast aluminum	17,2 (250)	17,2 (250)	Not Available	Not Available	Not Available
	Ductile iron	17,2 (250)	17,2 (250)	17,2 (250)	Not Available	Not Available
	Steel	17,2 (250)	17,2 (250)	17,2 (250)	17,2 (250)	55,2 (800)
Maximum pressure to spring and diaphragm casings to prevent burst of casings during abnormal operation (leak to atmosphere and internal parts damage may occur).	Die cast aluminum	25,9 (375)	25,9 (375)	Not Available	Not Available	Not Available
	Ductile iron	32,1 (465)	32,1 (465)	32,1 (465)	32,1 (465)	Not Available
	Steel	103 (1500)	103 (1500)	103 (1500)	103 (1500)	103 (1500)
Maximum diaphragm casing overpressure (above setpoint) to prevent damage to internal parts.	All materials	4,1 (60)	8,3 (120)	4,1 (60)	8,3 (120)	8,3 (120)

1. If the spring case is pressurized, a metal adjusting screw cap is required. Contact your local Sales Office for details.

**Startup**

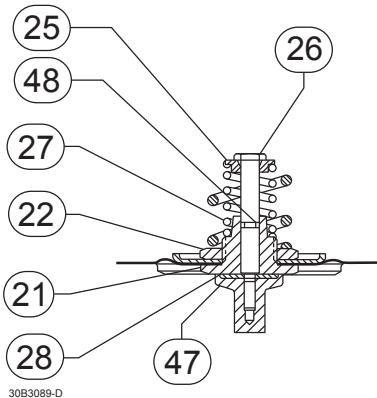
The regulator is factory set at approximately the midpoint of the spring range or the pressure requested, so an initial adjustment may be required to give the desired results. With proper installation completed and relief valves properly adjusted, slowly open the upstream and downstream shutoff valves.

**Adjustment**

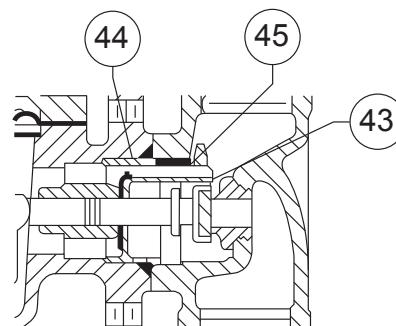
To change the outlet pressure, remove the closing cap or loosen the locknut and turn the adjusting screw clockwise to increase outlet pressure or counterclockwise to decrease pressure. Monitor the outlet pressure with a test gauge during the adjustment. Replace the closing cap or tighten the locknut to maintain the desired setting.

**Taking Out of Service (Shutdown)****WARNING**

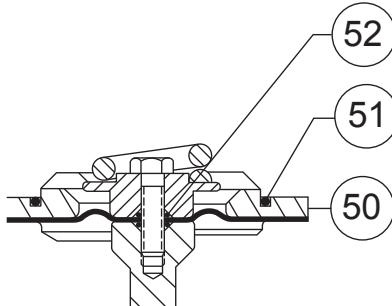
**To avoid personal injury resulting from sudden release of pressure, isolate the regulator from all pressure before attempting disassembly.**



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**Figure 1. Type 627R Regulator Components****Figure 2. Type 627M Regulator Components****Figure 3. Type 627H Regulator Components**

# 627 Series

## Parts List

### Key Description

- 1 Body
- 2 Orifice
- 3 Cap Screw (not shown)
- 4 Diaphragm Case O-ring (for Type 627, 627H, or 627R only)
- 5 Diaphragm Case
- 6 Boost Body (not for Type 627M, 627HM, or 627MR)
- 7 Stabilizer (for Types 627, 627H, 627R, and 627LR only)
- 8 Stem Guide (for Types 627, 627H, 627R, and 627LR only)
- 9 Disk Assembly (for all Orifice Sizes)
- 10 Stem
- 11 Stem O-ring
- 12 Stem Backup Ring
- 13 Hair Pin Clip
- 14 Drive Pin
- 15 Lever
- 16 Lever Retainer
- 17 Lever Pin
- 18 Lever Cap Screw
- 19 Pusher Post
- 21 Diaphragm Connector (for Type 627R or 627MR only)
- 22 Diaphragm Connector Nut (for Type 627 or 627MR only)
- 23 Diaphragm
- 24 Diaphragm Head
- 25 Relief Spring Seat (for Type 627R or 627MR only)
- 26 Guide Retainer (for Type 627R or 627MR only)
- 27 Relief Spring (for Type 627R or 627MR only)
- 28 Relief Spring O-ring (For Type 627R, 627LR, or 627MR only)
- 29 Spring Case
- 30 Screened Vent Assembly
- 31 Lower Spring Seat
- 32 Control Spring
- 33 Upper Spring Seat
- 34 Locknut
- 35 Adjusting Screw
- 36 Adjusting Screw Cap
- 37 Spring Case Cap Screw
- 43 Blocked Throat (for Type 627M, 627HM, or 627MR only)
- 44 Blocked Throat O-ring (For Type 627M, 627HM, or 627MR only)
- 45 Blocked Throat Backup Ring (for Type 627M, 627HM, or 627MR only)

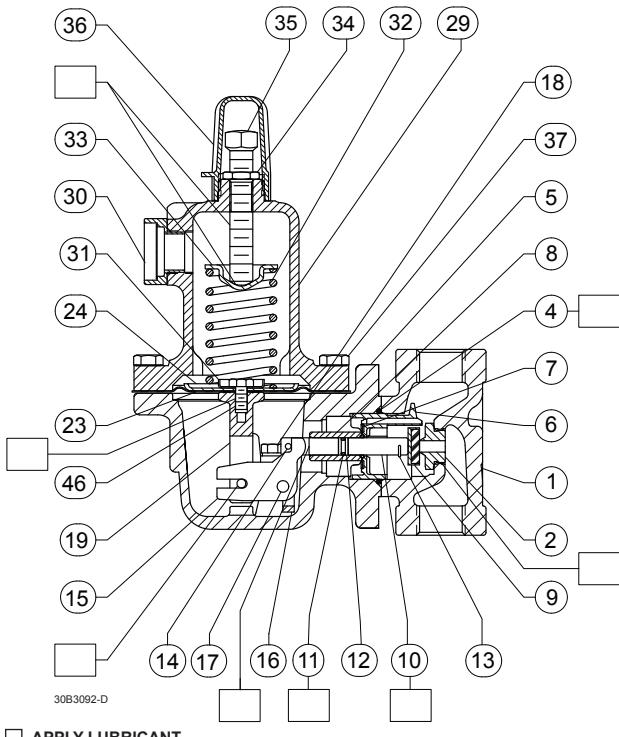


Figure 4. Type 627 Regulator Assembly

### Key Description

- 46 Diaphragm Head Cap Screw
- 47 Relief Seal Retainer (for Type 627R or 627MR only)
- 48 Guide Retainer O-ring (for Type 627R, 627LR, or 627MR only)
- 49 Relief Indicator (for Type 627R or 627MR only)
- 50 Diaphragm Limiter (for Types 627H and 627HM only)
- 51 Diaphragm Limiter O-ring (for Types 627H and 627HM only)
- 52 Pusher Post O-ring (for Types 627H and 627HM only)

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